DECLARATION OF CONFORMITY

According to FCC Part 15

Applicant Name :	KEPID AMSTECH CO., LTD.
Address :	103-604 SK VENTIUM, 522 DANGJEONG-DONG, GUNPO-SHI, GYEONGGI-DO, Korea
Telephone :	+82-31-466-0386
Declares that Product :	Energy Meter Unit
Model Name :	Wi-GEM
Report Number :	2011120034

This device complies with Part 15 of the FCC rules. Operations is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Test Laboratory:

CTK Co., Ltd.

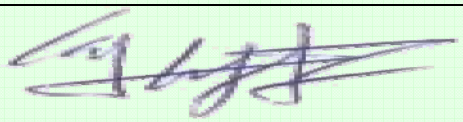
386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea

Registraion Number : 805871

Tel : +82-31-339-9970

Fax : +82-31-339-9855

Responsible Party:

Company Name :	KEPID AMSTECH CO., LTD.
Company Address :	103-604 SK VENTIUM, 522 DANGJEONG-DONG, GUNPO-SHI, GYEONGGI-DO, Korea
Phone :	+82-31-466-0386
Fax :	+82-31-466-0385
Name :	BYUNG JUN NA
Signature :	

CTK Co., Ltd.
386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea
Tel: +82-31-339-9970 Fax: +82-31-339-9855
www.e-ctk.com

EMC TEST REPORT For FCC

Test Report No.	:	2011120034
Date of Issue	:	December 12, 2011
Model/Type No.	:	Wi-GEM
Kind of Product	:	Energy Meter Unit
Applicant	:	KEPID AMSTECH CO., LTD.
Applicant Address	:	103-604 SK VENTIUM, 522 DANGJEONG-DONG, GUNPO-SHI, GYEONGGI-DO, Korea
Manufacturer	:	KEPID AMSTECH CO., LTD.
Manufacturer Address	:	103-604 SK VENTIUM, 522 DANGJEONG-DONG, GUNPO-SHI, GYEONGGI-DO, Korea
Contact Person	:	BYUNG JUN NA
Telephone	:	+82-31-466-0386
Received Date	:	December 6, 2011
Test Date	:	December 7, 2011
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

Tested by

Lee Eun-Won
EMC Test Engineer
Date: December 12, 2011

Reviewed by

James Hong
EMC Technical Manager
Date: December 12, 2011

REPORT REVISION HISTORY

Date	Revision	Page No
December 12, 2011	Issued (2011120034)	All

This report shall not be reproduced except in full, without the written approval of CTK Co., Ltd. This document may be altered or revised by CTK Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by CTK Co., Ltd. will constitute fraud and shall nullify the document.

TABLE OF CONTENTS

1.0 General Product Description

1.0.1 Tested Equipment

☒ Unless otherwise indicated, all tests were conducted on Model Wi-GEM.
☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 67(W) by 133(D) by 38(H) ☒ ㎜
Mobility: ☒ Table-top ☐ Floor-standing ☐ Built-in ☐ Portable
Serial No.: Prototype

1.0.3 Electrical Ratings

Input : 57-277 Vac, 50/60 ㎐, 12 VA
Output : -

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: 120 Vac
Frequency: 60 ㎐

1.0.5 Clock & Other Frequencies Utilized

32.768 ㎑, 24 ㎒

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.3 EUT Configuration(s)

See Appendix B for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Sensor (R)	KEPID AMSTECH CO., LTD.	JC16F	-
Sensor (S)	KEPID AMSTECH CO., LTD.	JC16F	-
Sensor (T)	KEPID AMSTECH CO., LTD.	JC16F	-
Notebook	SAMSUNG Electronics Co., Ltd.	SP10	CN02100002
Adapter	Li Shin International Electronics Co., Ltd.	0335C1960	-
RS232 to RS485 Converter	SYSBAS	CS-428/9AT-mini	-

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	AC Power Cable, Unshielded	No	1.8	Connect to AC power
2	Sensor Cable, Unshielded	No	0.8	Between the EUT and a Sensor (R)
3	Sensor Cable, Unshielded	No	0.8	Between the EUT and a Sensor (S)
4	Sensor Cable, Unshielded	No	0.8	Between the EUT and a Sensor (T)
5	RS485 Cable, Unshielded	No	2.0	Between the EUT and a RS232 to RS485 Converter
6	RS232 Cable, Unshielded	No	2.0	Between a RS232 to RS485 Converter and a Notebook
7	DC In Cable, Unshielded	Yes	1.5	Between a Notebook and Adapter
8	AC Power Cable, Unshielded	No	1.8	Connect to AC power

1.4 Test Software

☐ EMC Test V 1.0
☐ Display Test Patterns – V1.5
☐ Ping.exe
☒ Wi-GEM Data Monitoring V1.2.C

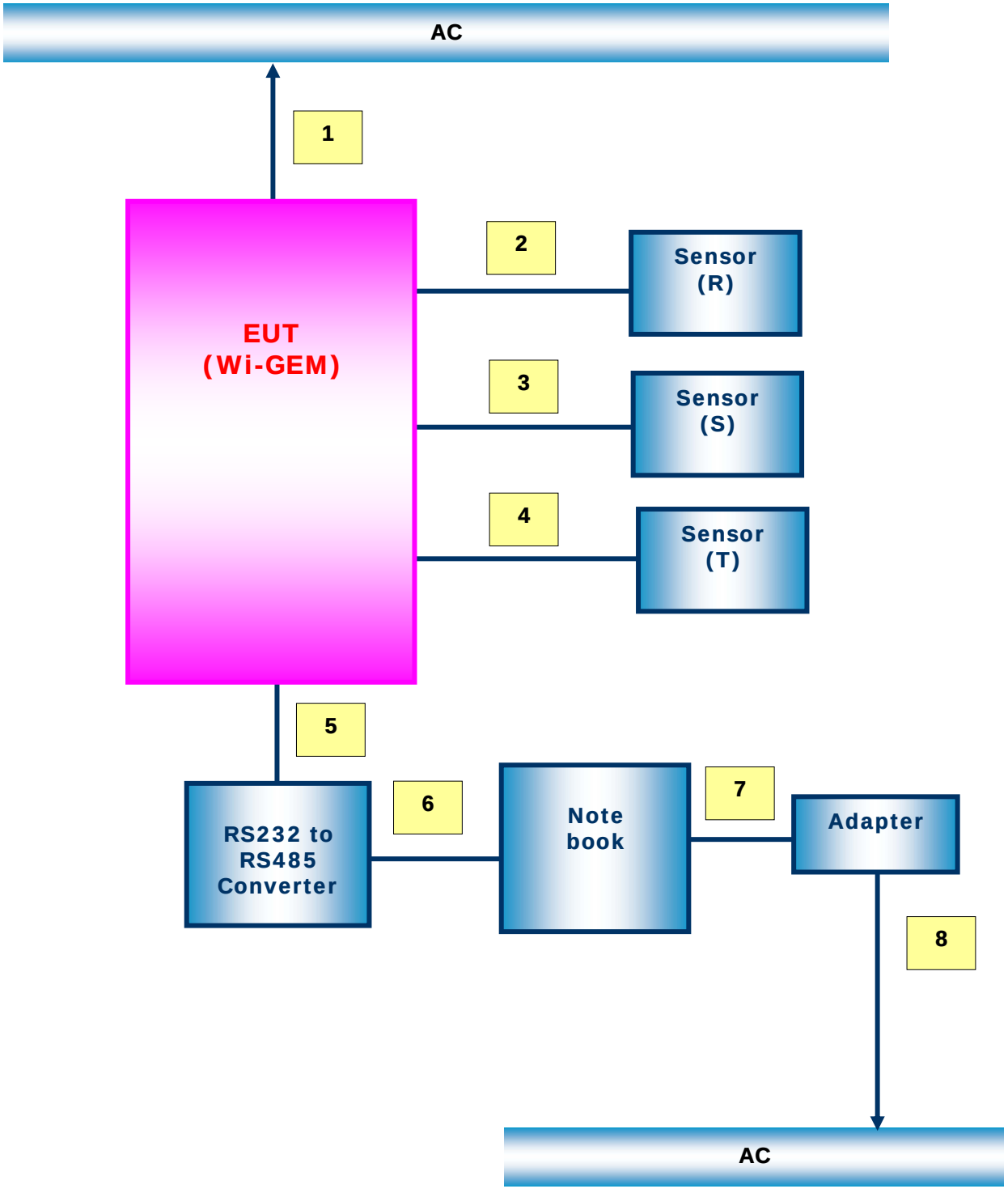
1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

☐ Standby
☐ Display circles pattern
☒ Practice operation – RS485 MODE
☐ Scrolling 'H'
☐ Read / Write

During the test, the EUT was connected to a PC via RS232-RS485 port.

1.6 Configuration



1.7 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.8 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.9 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested.
Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)
Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-2003 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

1.10 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	**FCC**	3 m & 10 m OATS, 3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements	805871
JAPAN	**VCCI**	10 m OATS, 3 m & 10 m SAC and Conducted Test Site	R-948, C-986, T-1843, R-3627, G-387
KOREA	**KCC**	EMI (10 m OATS, 10 m SAC and Conducted Test Site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and Interruptions)	No. 51, KR0025

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

☐ EN 61000-6-3:2007		
☐ EN 61000-6-4:2007		
☐ EN 55011:2007 +A2:2007	☐ Group 1 ☐ Class A	☐ Group 2 ☐ Class B
☐ EN 55013:2001 +A1:2003 +A2:2006		
☐ EN 55014-1:2006 ☐ EN 55014-1:2006 +A1:2009		
☐ EN 55015:2006 +A1:2007 +A2:2009		
☐ EN 61204-3:2000	☐ Class A	☐ Class B
☐ EN 61131-2:2007		
☐ EN 61326-1:2006	☐ Class A	☐ Class B
☐ EN 55022:2006 +A1:2007	☐ Class A	☐ Class B
☐ EN 61000-3-2:2006 +A1:2009 +A2:2009		
☐ EN 61000-3-3:2008		
☐ VCCI V-3/2010.04	☐ Class A	☐ Class B
☐ AS/NZS CISPR22:2006	☐ Class A	☐ Class B
☒ FCC Part 15 Subpart B	☐ Class A	☒ Class B
☐ CISPR 22:2006	☐ Class A	☐ Class B

2.1 Conducted Voltage Emissions

Test Date
December 7, 2011

Test Location
Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	EMI Test Receiver	Rohde & Schwarz	ESCI3	100032	2012-02-09
☒	LISN	Rohde & Schwarz	ENV216	101235	2012-08-18
☒	LISN	Rohde & Schwarz	ENV216	101236	2012-08-06
☐	EMI Test Receiver	Rohde & Schwarz	ESHS30	828144/002	2012-02-09
☐	LISN	Rohde & Schwarz	ENV216	101150	2012-02-10
☐	LISN	EMCO	3825/2	9607-2575	2012-07-06

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are: ☒ MET ☐ NOT MET ☐ NOT APPLICABLE

Frequency (㎒)	Measured Data (dB㎶)	Margin (dB)	Remark
0.2535	37.6	14.1	Average

Remarks
See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date
December 7, 2011

Test Location
Testing was performed at a test distance of:

☐ 10 m OATS ☐ 3 m OATS
☐ 10 m SAC ☒ 3 m SAC

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☐	EMI Test Receiver	Rohde & Schwarz	ESVS30	826638/008	2012-07-07
☒	EMI Test Receiver	Rohde & Schwarz	ESCI7	100814	2011-12-13
☒	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	100203	2013-07-05
☒	AMPLIFIER	Sonoma Instrument Co.	310	291721	2012-03-31
☐	EMI Test Receiver	Rohde & Schwarz	ESCI7	100816	2011-12-15
☐	Double Ridged Guide Antenna	ETS-Lindgren	3115	00078894	2013-03-22
☐	PREAMPLIFIER	Agilent Technologies	8449B	3008A02307	2012-11-17

Frequency Range of Measurement
☒ 30 ㎒ to 1 ㎓
☐ 1 ㎓ to __ ㎓

Instrument Settings
☒ IF Band Width: 120 ㎑
☐ IF Band Width: 1 ㎒

Test Results
The requirements are: ☒ MET ☐ NOT MET ☐ NOT APPLICABLE

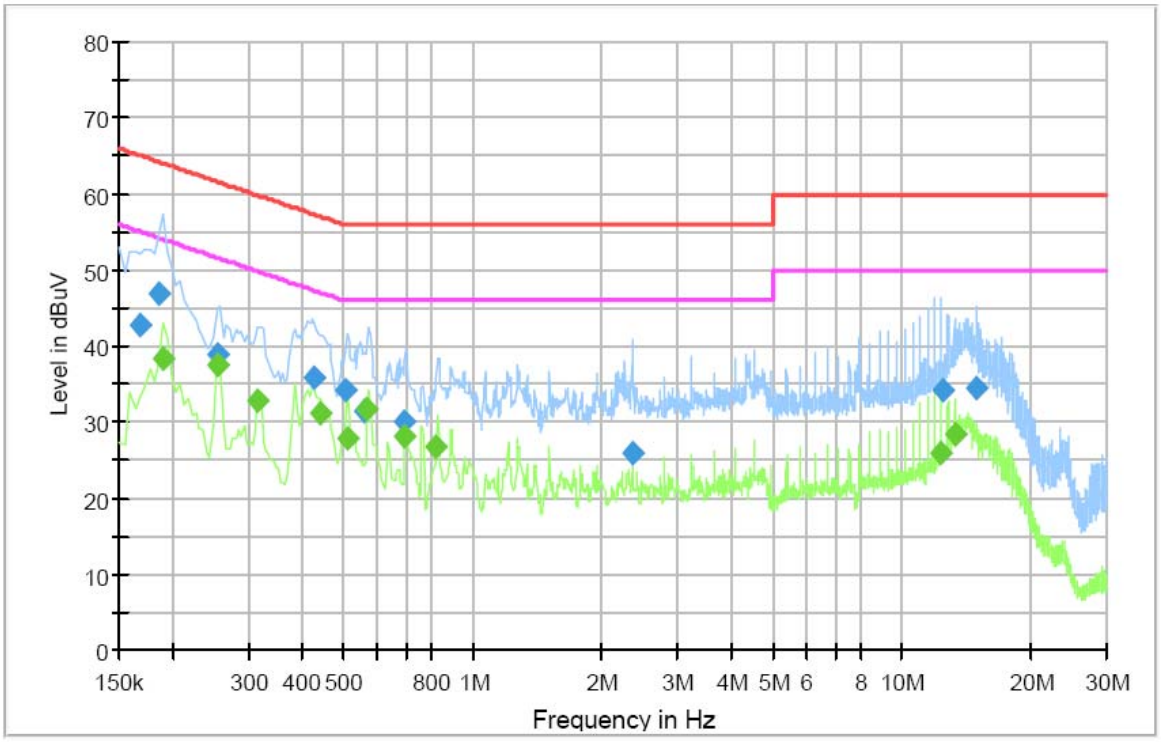
Frequency (㎒)	Measured Data (dBμV/m)	Margin (dB)	Remark
364.529	42.1	3.9	Quasi-peak

Remarks
See Appendix A for test data.

APPENDIX A – TEST DATA

Conducted Voltage Emissions

[HOT]



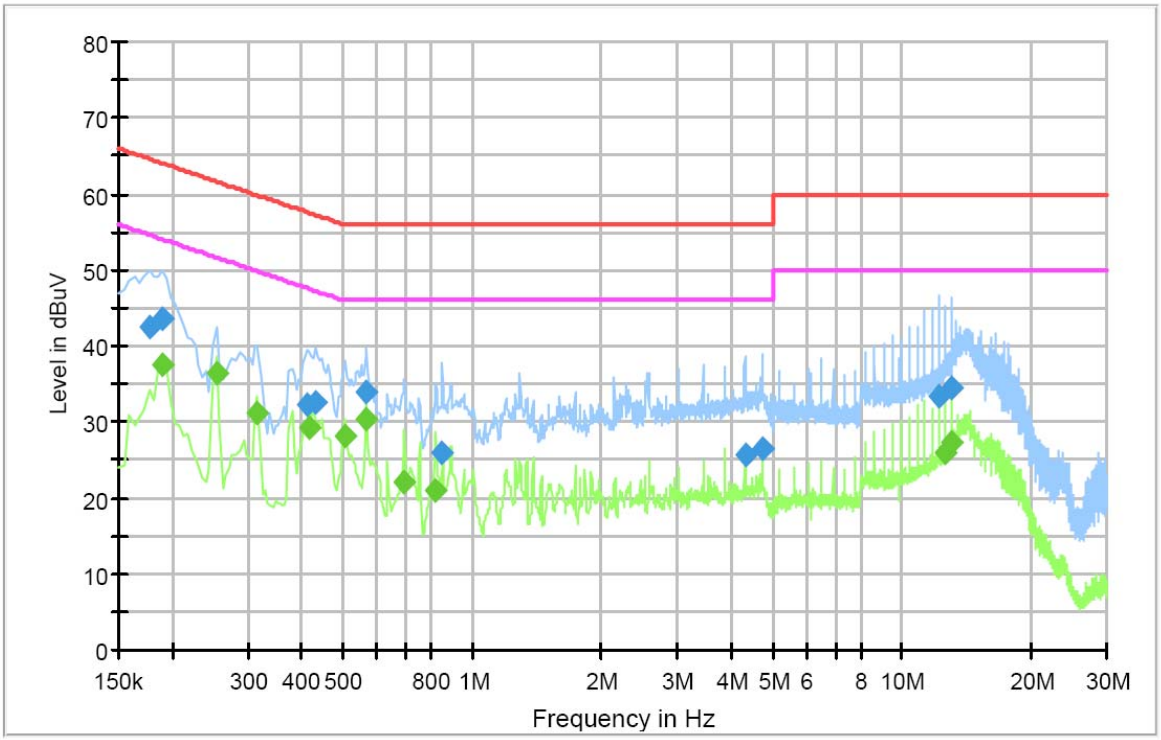
Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.168000	42.7	1000.0	9.000	On	L1	9.9	22.4	65.1
0.186000	47.0	1000.0	9.000	On	L1	10.0	17.2	64.2
0.253500	38.8	1000.0	9.000	On	L1	10.1	22.8	61.6
0.429000	35.7	1000.0	9.000	On	L1	10.0	21.5	57.3
0.505500	34.3	1000.0	9.000	On	L1	10.0	21.7	56.0
0.559500	31.4	1000.0	9.000	On	L1	10.0	24.6	56.0
0.690000	30.0	1000.0	9.000	On	L1	10.1	26.0	56.0
2.359500	25.8	1000.0	9.000	On	L1	9.9	30.2	56.0
12.408000	34.3	1000.0	9.000	On	L1	9.8	25.7	60.0
15.018000	34.4	1000.0	9.000	On	L1	9.8	25.6	60.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.190500	38.3	1000.0	9.000	On	L1	10.0	15.7	54.0
0.253500	37.6	1000.0	9.000	On	L1	10.1	14.1	51.6
0.316500	32.7	1000.0	9.000	On	L1	10.0	17.1	49.8
0.442500	31.3	1000.0	9.000	On	L1	10.0	15.7	47.0
0.510000	27.9	1000.0	9.000	On	L1	10.0	18.1	46.0
0.568500	31.7	1000.0	9.000	On	L1	10.0	14.3	46.0
0.694500	28.2	1000.0	9.000	On	L1	10.1	17.8	46.0
0.820500	26.8	1000.0	9.000	On	L1	10.1	19.2	46.0
12.376500	26.0	1000.0	9.000	On	L1	9.8	24.0	50.0
13.290000	28.3	1000.0	9.000	On	L1	9.8	21.7	50.0

[NEUTRAL]



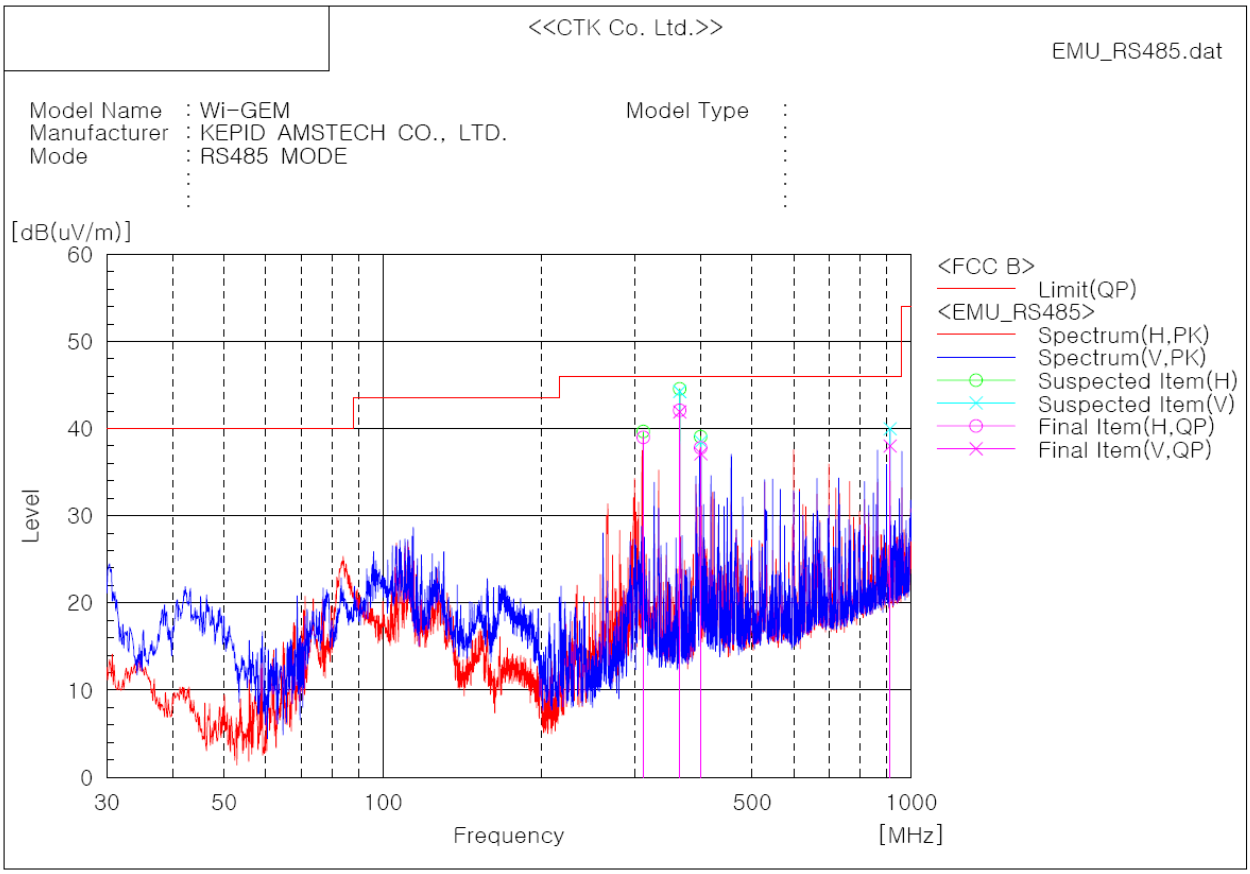
Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.177000	42.6	1000.0	9.000	On	N	10.0	22.0	64.6
0.190500	43.6	1000.0	9.000	On	N	10.1	20.4	64.0
0.411000	32.2	1000.0	9.000	On	N	10.0	25.5	57.6
0.433500	32.5	1000.0	9.000	On	N	9.9	24.7	57.2
0.568500	33.9	1000.0	9.000	On	N	10.0	22.1	56.0
0.852000	25.9	1000.0	9.000	On	N	10.0	30.1	56.0
4.312500	25.6	1000.0	9.000	On	N	9.8	30.4	56.0
4.744500	26.4	1000.0	9.000	On	N	9.8	29.6	56.0
12.174000	33.5	1000.0	9.000	On	N	9.7	26.5	60.0
13.051500	34.4	1000.0	9.000	On	N	9.8	25.6	60.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.190500	37.5	1000.0	9.000	On	N	10.1	16.5	54.0
0.253500	36.4	1000.0	9.000	On	N	10.1	15.3	51.6
0.316500	31.3	1000.0	9.000	On	N	10.0	18.5	49.8
0.415500	29.2	1000.0	9.000	On	N	10.0	18.4	47.5
0.505500	28.3	1000.0	9.000	On	N	9.9	17.8	46.0
0.568500	30.3	1000.0	9.000	On	N	10.0	15.7	46.0
0.694500	22.1	1000.0	9.000	On	N	10.1	23.9	46.0
0.820500	21.0	1000.0	9.000	On	N	10.1	25.0	46.0
12.615000	25.9	1000.0	9.000	On	N	9.8	24.1	50.0
13.056000	27.4	1000.0	9.000	On	N	9.8	22.6	50.0

Radiated Electric Field Emissions

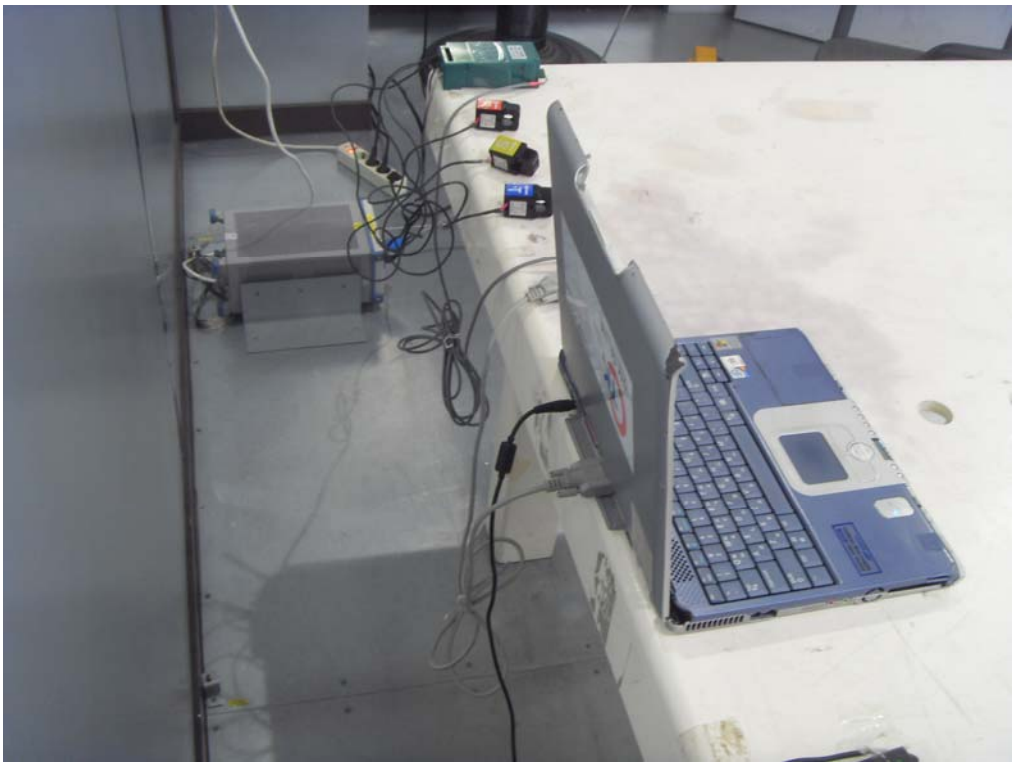


Final Result

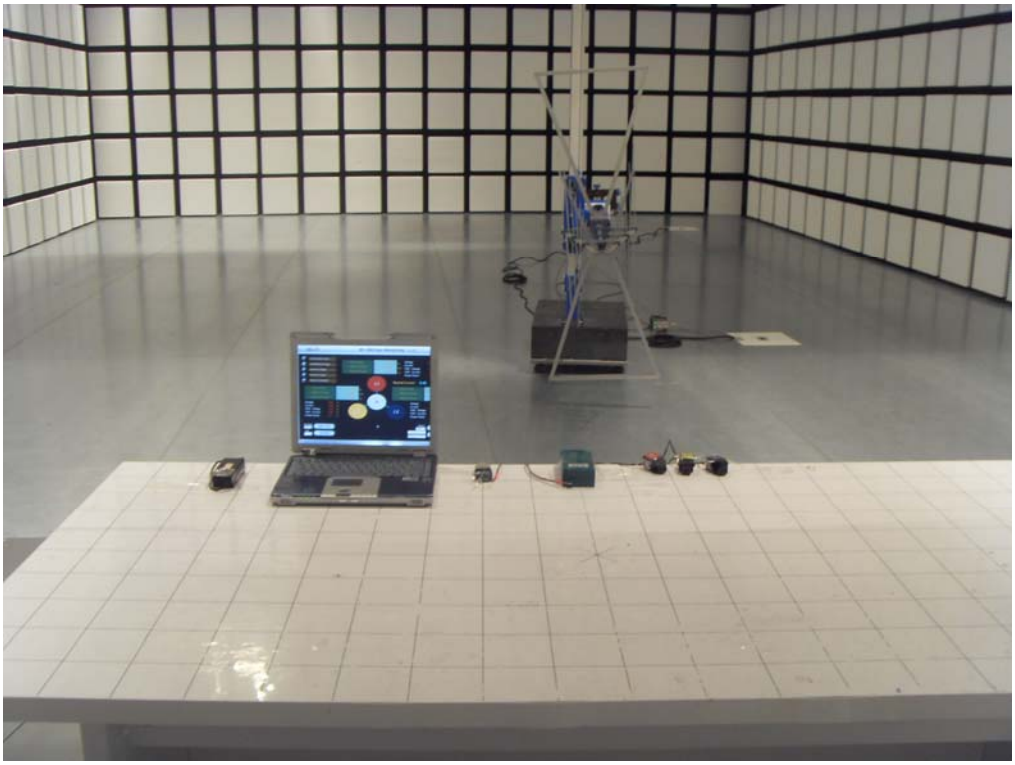
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	311.058	H	53.1	-14.1	39.0	46.0	7.0	100.0	6.0	
2	364.529	H	54.3	-12.2	42.1	46.0	3.9	100.0	230.0	
3	364.529	V	54.1	-12.2	41.9	46.0	4.1	192.0	177.0	
4	399.449	H	49.3	-11.5	37.8	46.0	8.2	207.0	144.0	
5	399.934	V	48.6	-11.5	37.1	46.0	8.9	192.0	290.0	
6	912.215	V	38.4	-0.4	38.0	46.0	8.0	100.0	331.0	

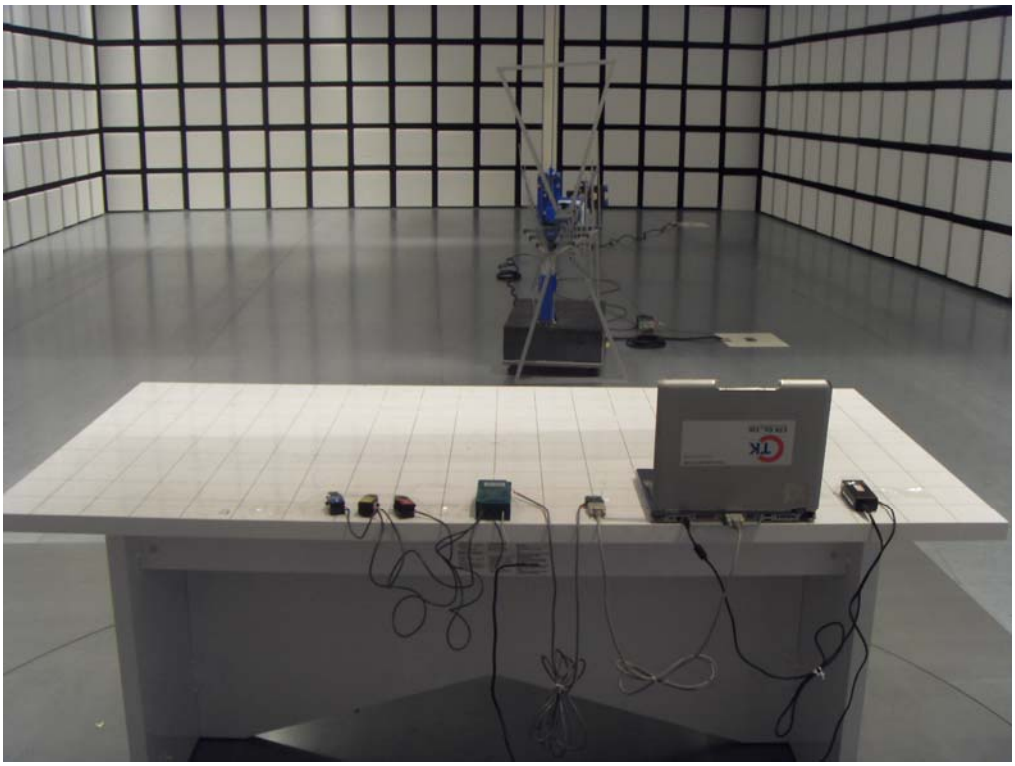
APPENDIX B - Test Setup Photos and Configuration

Conducted Voltage Emissions



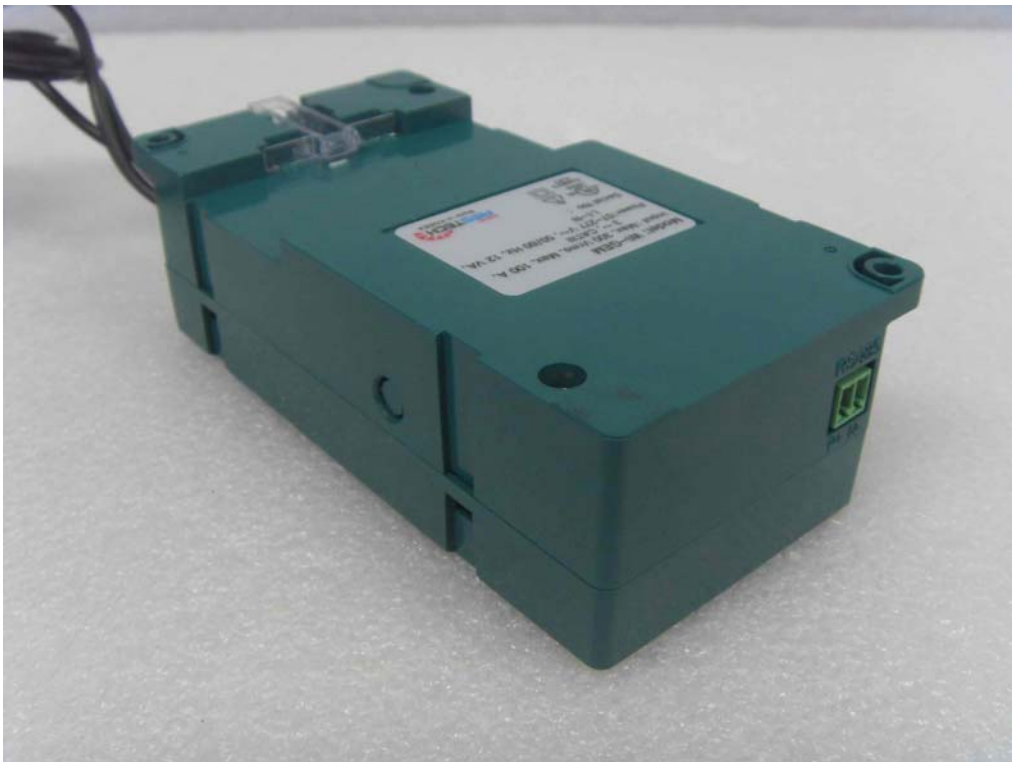
Radiated Electric Field Emissions



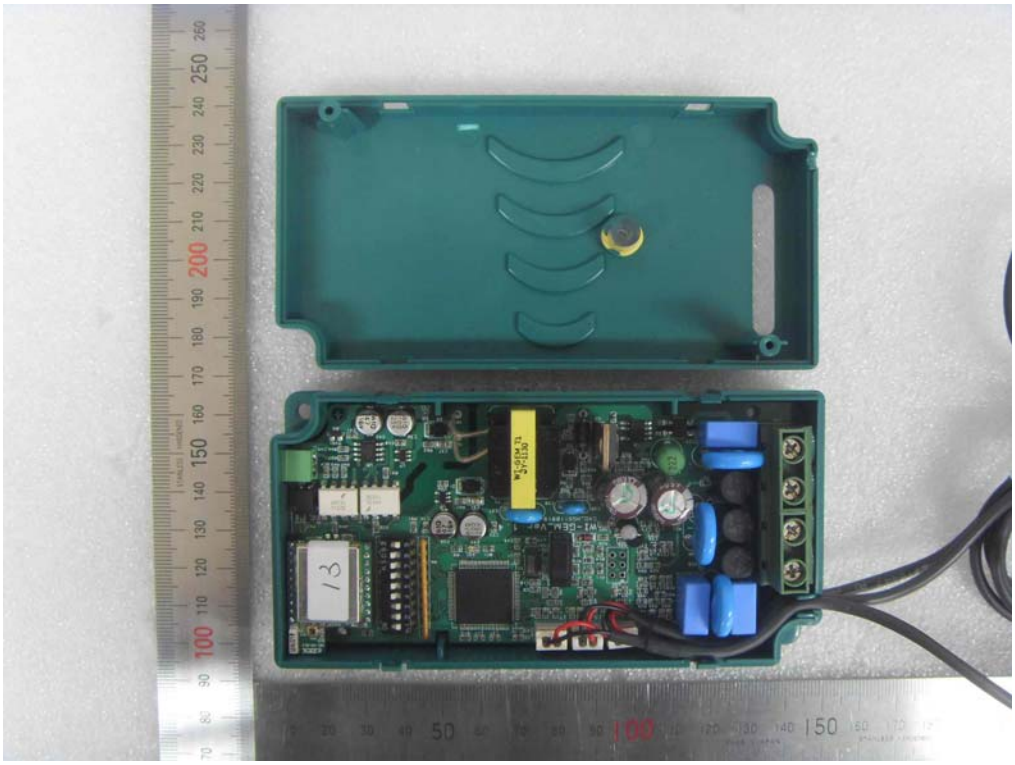


APPENDIX C – EUT Photographs

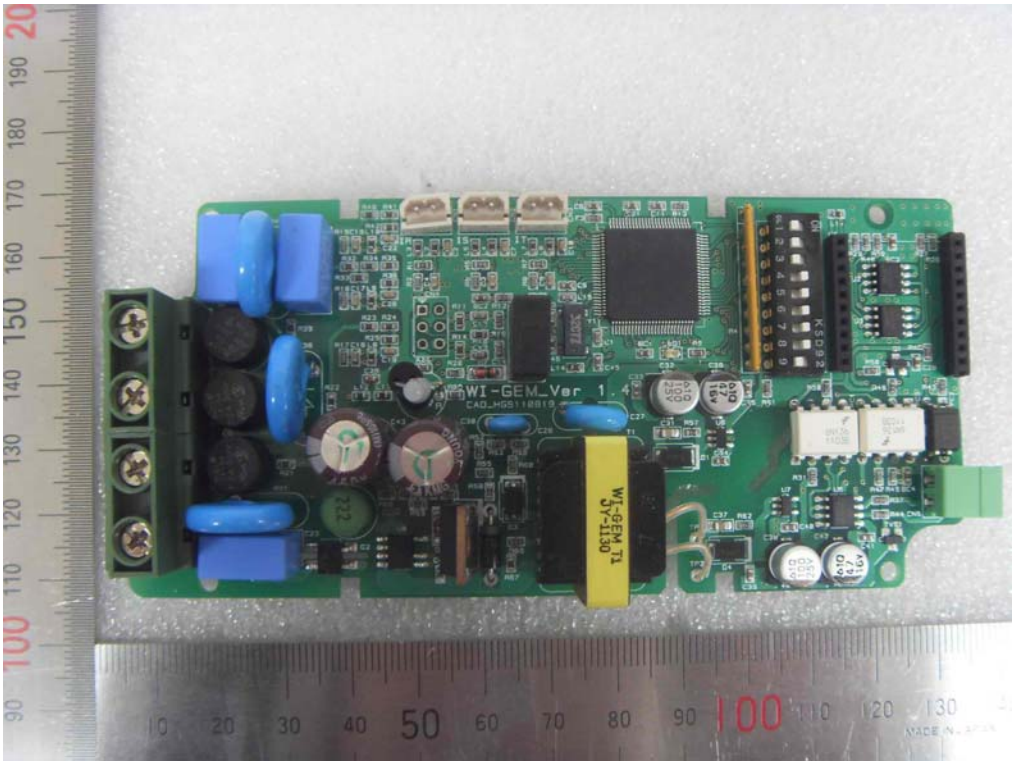
EUT External Photographs

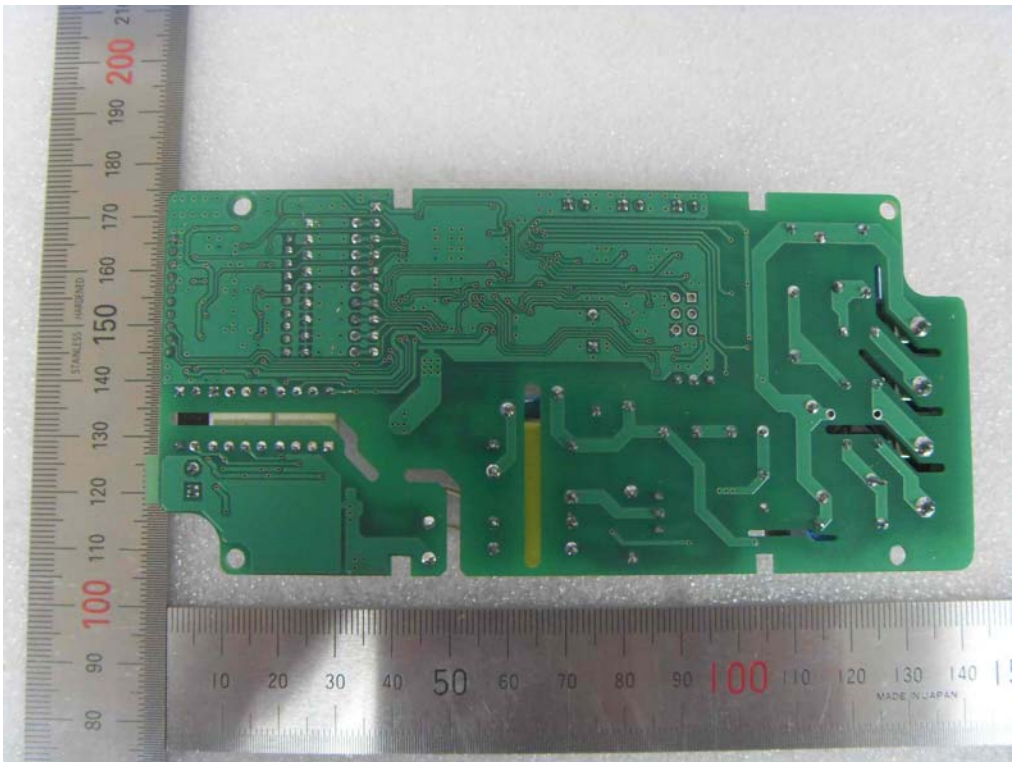


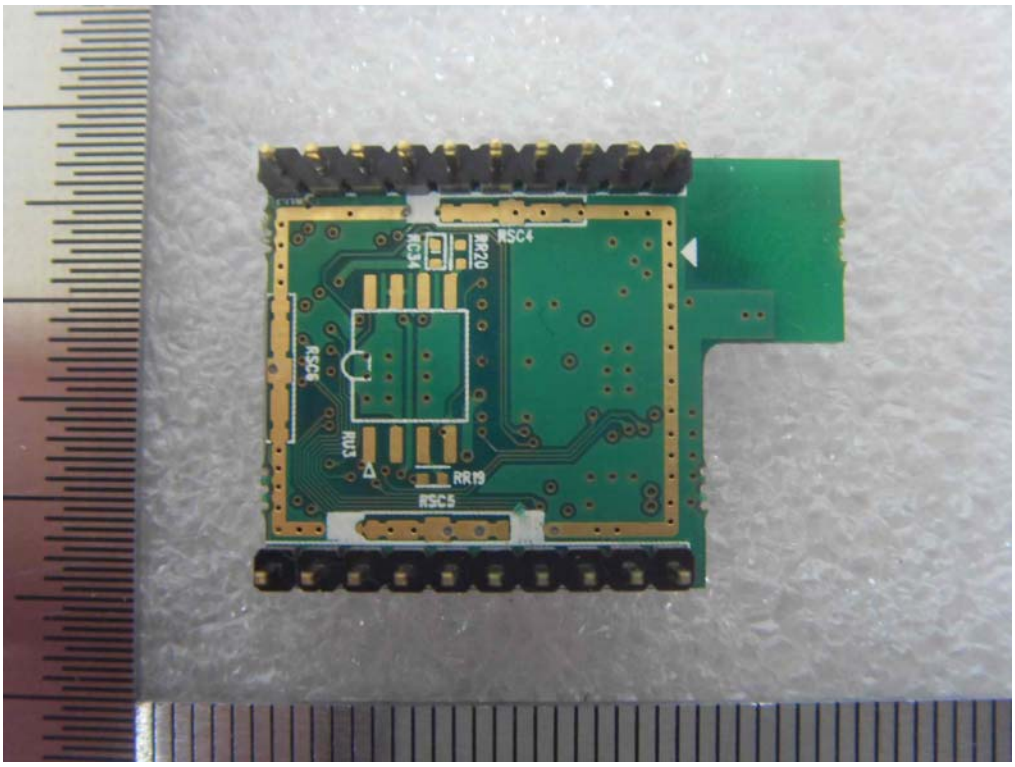
EUT Internal Photographs



PCB







Label and Location